U.S. DEPARTMENT OF ENERGY | Office of Science

Atmospheric System Research Update

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ASR Program Managers

October 25, 2022

2022 ARM-ASR Joint User Facility & PI Meeting

2020-2022 Challenges

- We know that the global pandemic has affected your life, your work, and your ASR-supported research
- We are committed to working with you through these challenges
- Thank you for taking the time to join the ARM and ASR communities this week.

Outline

- General updates
- ASR Funding: Reviews and Selections
  - DOE FOA 0002579 updates (FY22)
  - Other Prospective FOAs and timelines
  - Upcoming plans
- Communications updates
- Meeting details

Atmospheric System Research (ASR) program

ASR utilizes the long-term cloud, aerosol, precipitation, and meteorological datasets from the Atmospheric Radiation Measurement (ARM) user facility, targeted field campaigns, laboratory studies, and process models to address key uncertainties in processes associated with clouds and aerosols that affect the Earth's radiative balance and hydrological cycle and limit the predictive ability of regional and global models.

Priority research areas are aerosol processes, warm boundary-layer processes, convective processes, and high-latitude processes.

ASR supports research at the national labs as well as through grants to universities and other research institutions.

DOE, BER, EESSD, and ASR

- FY23 President's budget request is out there, as are the House and Senate authorizations
- The House and Senate passed a continuing resolution (CR) spending bill until after the election
  - We briefly became the Atmospheric System Science Research Program in the authorization
    - Write your own joke here
  - DOE Office of Science and BER request information can be found at https://science.osti.gov/budget.
  - Budget request for ASR was $39M
  - ASR language: "The Request for ASR will continue research on clouds, aerosols, and thermodynamic processes, with a focus on data from the ARM fixed sites as well as recent field campaigns conducted in the Arctic during FY 2020 and data from the TRACER and SAIL campaigns. ASR will continue to make use of data generated by Large Eddy Simulations at the ARM Oklahoma site."

This meeting brought to you by the ARM-ASR Coordination Team (AACT), ARM and ASR program managers, and the ARM and ASR community

- Allison Aiken (LANL), ARM User Executive Committee Chair
- Jim Mather (PNNL), ARM Technical Director
- Nicki Hickmon (ANL), ARM Associate Deputy for Operations
- Jennifer Comstock (PNNL), ARM Engineering and Process Manager
- Adam Theisen (ANL), ARM Instrument Operations Manager
- Giri Prakash (ORNL), ARM Data Services Manager
- Shaocheng Xie (LLNL), ARM Lead Translator
- Jerome Fast (PNNL), PNNL SFA Lead
- Michael Jensen (BNL), BNL-ANL SFA Lead
- Greg McFarquhar (Univ. of Oklahoma), High Latitude Processes WG
- Gijs de Boer (Univ. of Colorado), High Latitude Processes WG
- Nicole Riemer (Univ. of Illinois), Aerosol Processes WG
- Jim Smith (Univ. of California-Irvine), Aerosol Processes WG
- Adam Varble (PNNL), Convective Processes WG
- Hugh Morrison (NCAR), Convective Processes WG
- Rob Wood (Univ. of Washington), Warm Boundary-Layer Processes WG
- Yunyan Zhang (LLNL), Warm Boundary Layer Processes WG

ASR FY2022 research call FOA-0002579

- ASR issued a targeted research call on 9/27/2021 covering four topic areas:
  - **Aerosol-cloud interactions**
  - **Aerosol processes affecting cloud lifecycle, properties, and/or processes**
  - **Convective cloud processes**
  - **High latitude atmospheric processes**
- 117 Pre-applications by November 3, 2021
- 95 applications received (January 11, 2022 due date)
- Three two-day virtual review panels met in March 2021
- Decisions
  - FOA produced $14.5M in 23 awards
  - All decisions finalized by June 2022 (except one!)

FOA-0002579 Awards

PI Name	Institution	Proposal Title
Adams-Selin, Rebecca	Atmospheric and Environmental Research, Inc., Lexington, MA	Establishing a Holistic Understanding of Mesoscale Convective System Stratiform Precipitation Regions
Ahmed, Fiaz	University of California, Los Angeles	Thermodynamic and Non-thermodynamic Controls on Deep Convection in ARM Observations
Ajoku, Osinachi	Howard University, Washington, DC	Modeling Impacts on the Stratocumulus-to-Cumulus Transition Associated with Southern Africa Biomass Burning Outflow Constrained by ARM Observations
Choi, Yunsoo	University of Houston, TX	Incorporating ARM TRACER Campaign Data into a Fine-Resolution WRF-Chem-SBM Data Assimilation Framework: Sensitivity Analysis of Microphysics and Thermodynamics to CCN Profile
Collins, Don	University of California, Riverside	Understanding the impact of pollution aerosol from Los Angeles/Long Beach on clouds and radiation in and upwind of the EPCAPE study domain
Dzambo, Andrew	University of Oklahoma, Norman	Surface, aerosol, and meteorological controls on Arctic boundary layer clouds: Observations and simulations from MOSAiC and COMBLE
Farmer, Delphine	Colorado State University, Fort Collins	Observational constraints on size-resolved particle deposition across landscapes

FOA-0002579 Awards (continued)

PI Name	Institution	Proposal Title
Hallar, Anna	University of Utah, Salt Lake City	Using ARM data to Understand the Impact of New Particle Formation on Cloud Condensation Nuclei Concentration in Different Environments
Horowitz, Hannah	University of Illinois, Champaign	Improving the representation of Arctic sea salt aerosols in climate models using observations from field campaigns and remote sensing
Kuang, Zhiming	Harvard College, Cambridge, MA	Analyses of Cumulus Mixing Using ASR Aircraft Observations and LES Simulations
Lamb, Kara	Columbia University, New York, NY	Connecting Laboratory Experiments and In-Situ Observations of Depositional Ice Growth
Li, Zhanqing	University of Maryland, College Park	Investigation of surface-cloud coupling over land using ARM observations and model simulations
Lombardo, Kelly	The Pennsylvania State University	Understanding the Life Cycle of Deep Convective Storms Traversing Mountains Using CACTI Observations
Mechem, David	University of Kansas, Lawrence	Using ARM observations and large-eddy simulation to constrain cloud processing of CCN in boundary-layer clouds over the Eastern North Atlantic

FOA-0002579 Awards (continued)

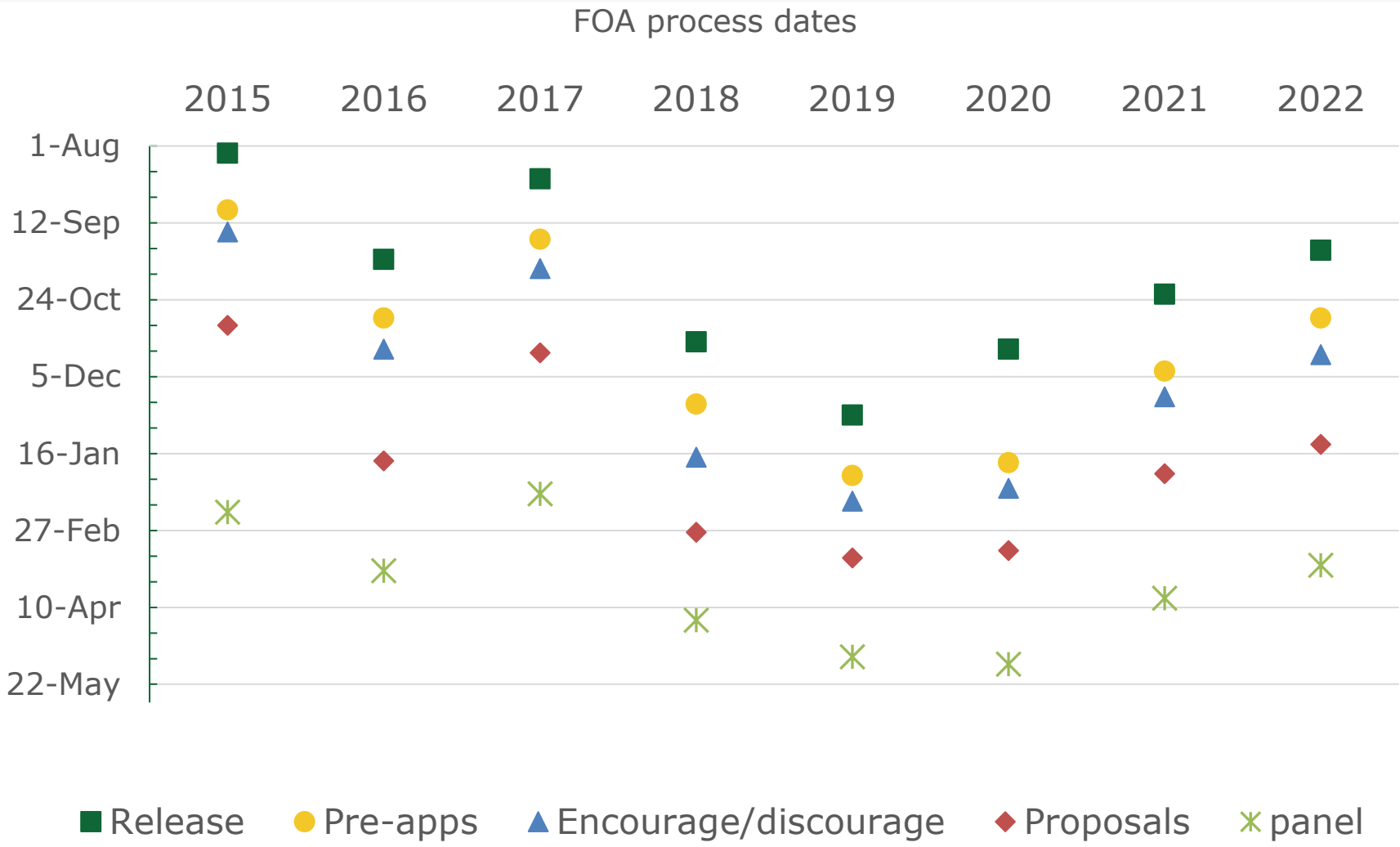
PI Name	Institution	Proposal Title
Persson, Ola	University of Colorado, Boulder, CO	The Arctic Atmospheric Boundary-Layer Structure and Its Interactions with the Free Troposphere and Surface
Peters, John	The Pennsylvania State University, State College, PA	Collaborative Proposal: Using ARM Observations and Large Eddy Simulations to Understand Downdrafts in Deep Convection
Smalley, Mark Witte, Mikael	University of California, Los Angeles Naval Postgraduate School	The aerosol-cold pool connection: impacts on marine low cloud morphology
Smith, James	University of California, Irvine	Ultrafine aerosol particle formation and impacts during EPCAPE
Sullivan, Ryan	Carnegie Mellon University, Pittsburgh	Potentially large contribution of biomass-burning aerosol to global ice nucleating particle concentrations and implications for aerosol lifecycle and cloud microphysics
Tan, Ivy	McGill University, Montreal	Exploiting ground-based observations to infer Arctic surface cloud feedbacks
van Leeuwen, Peter Jan	Colorado State University, Fort Collins	Aerosol-cloud interactions in warm clouds using advanced causal discovery
Wexler, Anthony	University of California, Davis	The Hygroscopicity and CCN Potential of Organic Aerosol Moieties

Prospective new FOAs in 2022 (for 2023 funding)

For FY23 we plan another ASR topical research call later in calendar 2022. Announcements will be made in ASR newsletter, ASR webpage, Office of Science BER funding page, and Grants.gov

ASR FOA	fiscal year of funding	# proposals submitted	# proposals selected	total funding	selection rate
1638	2017	74	15	$9.3 M	20%
1845	2018	70	19	$10.7 M	27%
2034	2019	94	24	$13.2 M	26%
2198	2020	87	31	$19.0 M	35%
2391	2021	85	26	$15.6 M	31%
2579	2022	94	22	$14.5 M	22%

Historical FOA dates

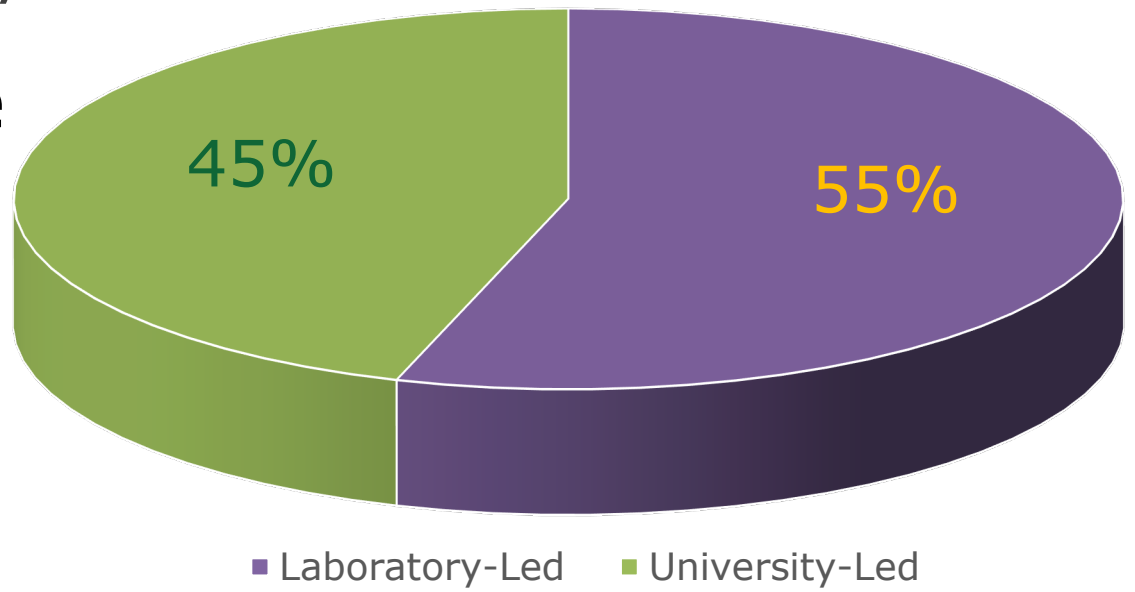


Additional plans for 2022/2023

- Workshops
  - Additional workshops on other topics are likely
    - Workshop guidelines: broad interest to the ASR community; emerging topics; new capabilities; opportunities for interdisciplinary science
    - Workshops can be very helpful to BER for planning
    - BER-organized workshops; ASR-supported workshops; community workshops with requests to ASR for support
  - Since we last met, we have been busy:
    - Land-atmosphere workshop June 2021
    - AI4ESP October – December 2021
    - DOE ASR/NOAA Marine Cloud Brightening April 2022
    - DOE ASR Future of LES Workshop April 2022

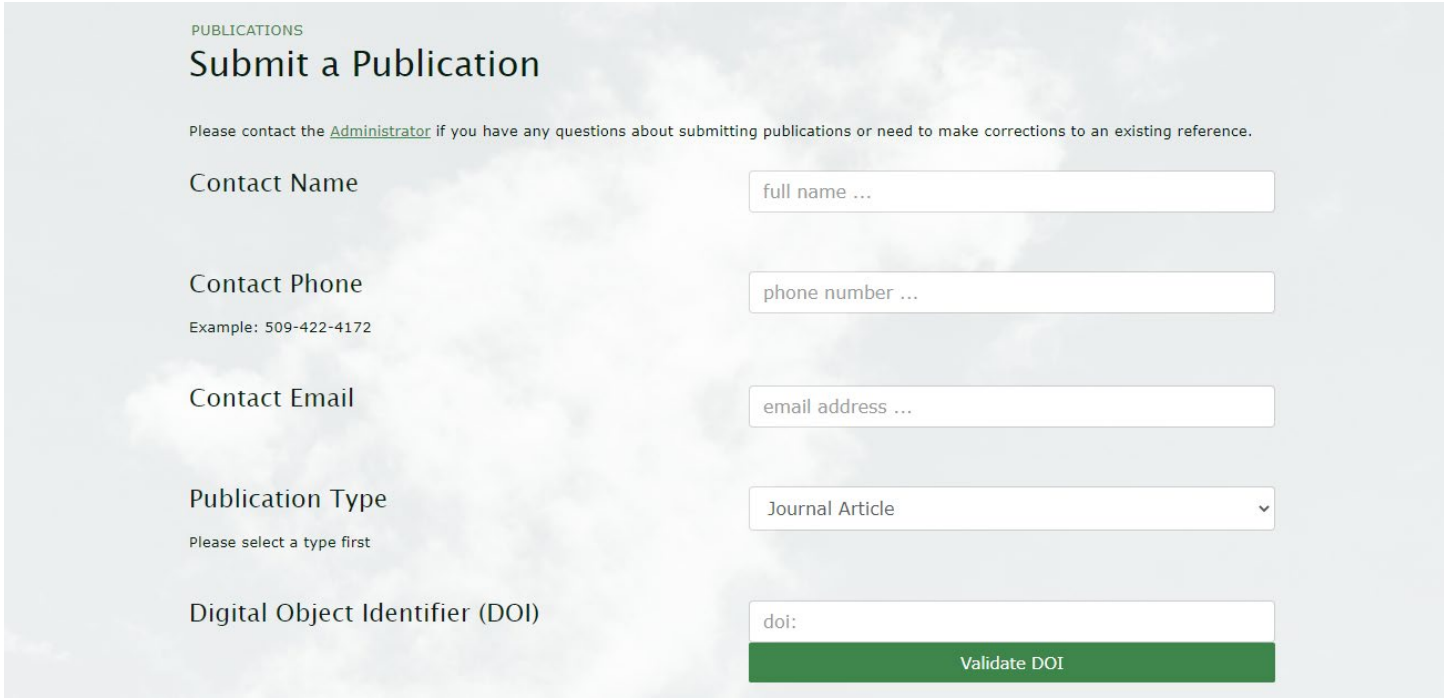
Documenting tax-payer funded research

- Important to document DOE-funded science
  - DOE Office of Science grants require journal articles to be archived with OSTI
  - New requirement that government-funded research results be accessible immediately with no paywalls
- ASR Research Highlights share your work with the public, scientific community, and DOE
  - 89 highlights submitted July 1, 2020, to October 11, 2022



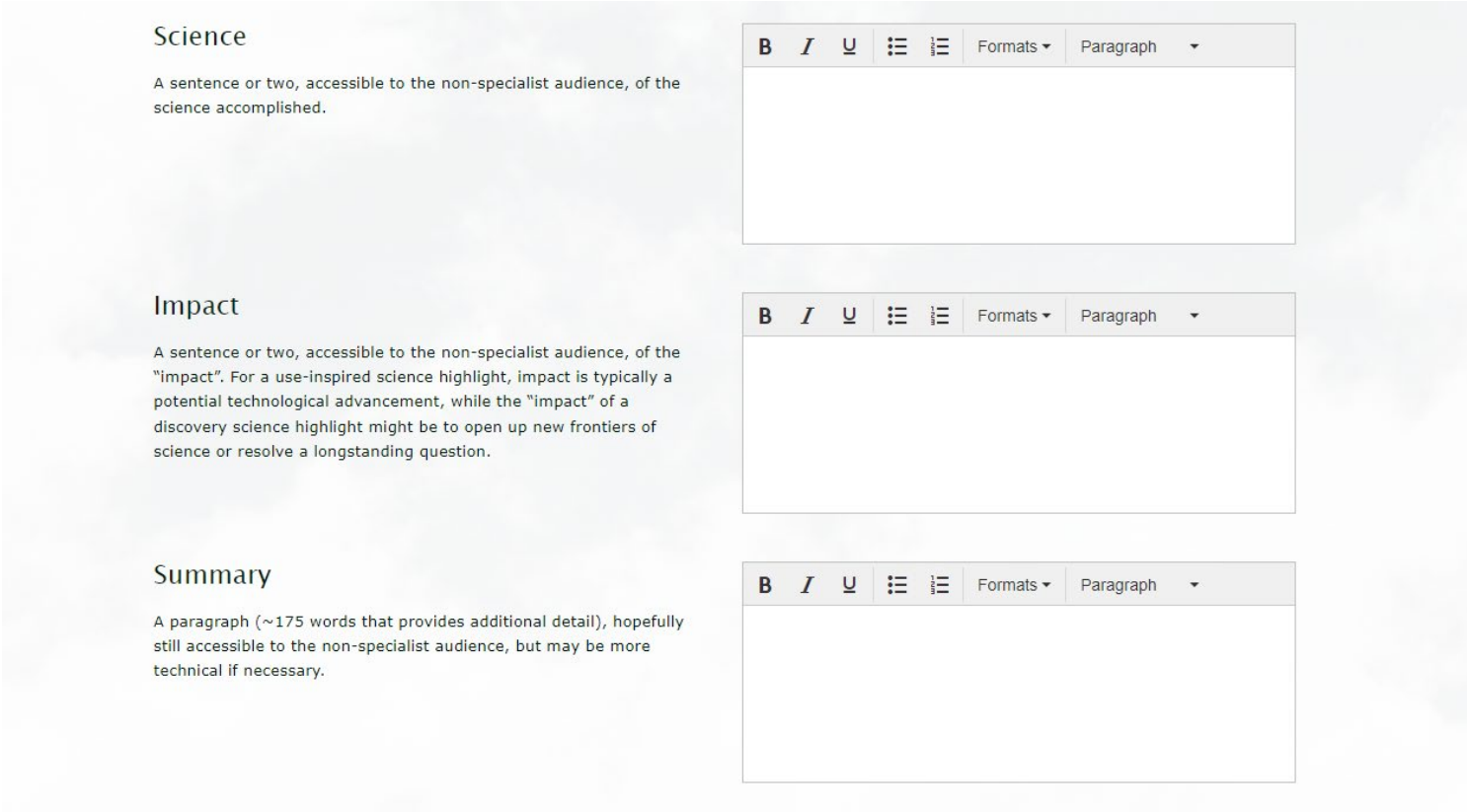
Sharing Your Journal Publications

- ASR has created a simple form that publishes your science to the ASR website *and* shares with OSTI
- Pulls data from DOI
- Include your DOE award/contract no.
- Opportunity to recognize colleagues and institutions
- Upload your accepted manuscript to be shared to OSTI without a paywall



Share Your Research through Highlights

- Please submit a research highlight for each of your ASR-funded publications
  - Critical opportunity to summarize your work and impact
  - Form Connects to publication
  - Describe your science and its impact
  - Include science summary slide and images



Welcome!

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